

WHAT IS CLAIMED IS:

1. An instrumented prosthetic foot for use with an actuated leg prosthesis controlled by a controller, the instrumented prosthetic foot comprising:
 - an elongated body having a top and a bottom part;
 - a connector to connect the instrumented prosthetic foot to the leg prosthesis, the connector being attached to the top part of the elongated body;
 - a ground engaging member attached to the bottom part of the elongated body;
 - at least one sensor for detecting changes in weight distribution along the foot; and
 - an interface for transmitting signals from the sensor to the controller.
2. An instrumented prosthetic foot according to claim 1, wherein:
 - the ground engaging member includes a pair of basic underfoot locations, the first region corresponding to the heel area of the human foot and second region corresponding to the toe area of the human foot.
3. An instrumented prosthetic foot according to claim 2, wherein:
 - at least two sensors are provided, one of the sensors being associated with each basic underfoot locations of the ground engaging member.
4. An instrumented prosthetic foot according to claim 3, wherein:
 - the sensors include a strain sensor to measure the strain applied at a corresponding basic underfoot location of the ground engaging member.

5. An instrumented prosthetic foot according to claim 3, wherein:
the sensors include a pressure sensor to measure the pressure applied at a corresponding basic underfoot location of the ground engaging member.
6. An instrumented prosthetic foot according to claim 3, wherein:
the sensors include a load cell to measure the pressure applied at a corresponding basic underfoot location of the ground engaging member.
7. An instrumented prosthetic foot according to claim 3, wherein:
the sensors are positioned under the ground engaging member.
8. An instrumented prosthetic foot according to claim 3, wherein:
the sensors are positioned between the ground engaging member and the elongated body.
9. An instrumented prosthetic foot according to claim 3, wherein:
the sensors are positioned between the elongated body and the connector.
10. An instrumented prosthetic foot according to claim 5, wherein:
the pressure sensor is a force-sensing resistor.
11. An instrumented prosthetic foot according to claim 5, further comprising:
a rigid plate placed on at least one side of the sensor.
12. An instrumented prosthetic foot according to claim 11, further comprising:
a resilient pad covering the rigid plate and the sensor.

13. An instrumented prosthetic foot according to claim 1, further comprising:
an ankle structure pivotally connecting the elongated body to the connector.
14. An instrumented prosthetic foot according to claim 13, wherein:
at least two sensors are provided, the sensors including two load cells positioned between the connector and the ankle structure.
15. An instrumented prosthetic foot according to claim 13, wherein:
at least two sensors are provided, the sensors including an optical encoder and a load cell, the optical encoder being positioned on the ankle structure about its pivot axis with the elongated body and the load cell being positioned between the ankle structure and the connector.
16. An instrumented prosthetic foot according to claim 1, wherein:
the interface for transmitting signals from the sensor to the controller is a wired connection.
17. An instrumented prosthetic foot according to claim 1, wherein:
the interface for transmitting signals from the sensor to the controller is a wireless connection.
18. An instrumented prosthetic foot according to claim 1, further comprising:
means for removably connecting the instrumented prosthetic foot to the leg prosthesis.